



## QUIZZES

### Practice Test-1(Gases)



10 Questions



7 min

#### Topics

Properties of Gases, Boyle's law, Charles's law,  
Avogadro's law

Start Quiz

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06 : 57



1/10



7 min



Hint

Q : A curve drawn at constant temperature is called an isotherm. This shows relationship between



P and  $1/V$



PV and V



P and V



V and  $1/P$

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06 : 54



2/10



7 min



Hint

Q : The volume of given mass of gas is \_\_\_\_ to inverse of pressure



Inversely proportional



Directly proportional



Equal



Constant

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06 : 52



3/10



7 min



Hint

Q : Volume of gas at  $0^{\circ}\text{C}$  and 1 atm pressure is  $10\text{dm}^3$ ,  
volume of gas at 0.8atm will be

A

$10\text{dm}^3$

B

$12.5\text{dm}^3$

C

$8\text{dm}^3$

D

$5\text{dm}^3$

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06 : 50



4/10



7 min



Hint

Q : Which is not equal to 1 atm



1.013 25 Bar



14.7 psi



1.01325 KPa



101325 Pa

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06 : 48



5/10



7 min



Hint

Q : Gases are soluble in water at



Low temperature and high pressure



High temperature and high pressure



Low temperature and low pressure



High temperature and low pressure

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06 : 46



6/10



7 min



Hint

Q : The molar volume of  $\text{CO}_2$  gas is maximum at



273 k and 1 atm



127°C and 1 atm



0°C and 2 atm



273°C and 2 atm

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06 : 44



7/10



7 min



Hint

Q : If volume of  $O_2$  is  $11.2\text{dm}^3$  at STP, then the number of moles would be



2.0 moles



0.5 moles



1.0 moles



0.25 moles

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06 : 42



8/10



7 min



Hint

Q : For a given mass with initial volume 'V', if pressure is reduced to one half and absolute temperature is increased two times. The volume will become

A

$2V^2$

B

$2V$

C

$4V$

D

$6V$

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06 : 40



9/10



7 min



Hint

Q : Pressure remaining constant at which temperature the volume of gas will become twice of what it is at  $0^{\circ}\text{C}$

A

$546^{\circ}\text{C}$

B

$200^{\circ}\text{C}$

C

$546\text{ K}$

D

$273\text{ K}$

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06 : 37



10/10



7 min



Hint

Q : The equation  $V_t = V_o \left(1 + \frac{t}{273}\right)$  is based on



Celsius scale



Fahrenheit scale



Kelvin scale



Absolute scale

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## QUIZ RESULT

Practice Test-1(Gases)



10



7 min



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0 sec



0/10



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Result Detail

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Correct

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Incorrect

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Chemistry

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Correct



Unattempted



Incorrect



1/10

Q : A curve drawn at constant temperature is called an isotherm. This shows relationship between



P and  $1/V$



PV and V



P and V



V and  $1/P$

Explanation

$V \propto \frac{1}{P}$  so, it provide an isothermal curve

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Unattempted



Incorrect



2/10

Q : The volume of given mass of gas is \_\_\_\_ to inverse of pressure



Inversely proportional



Directly proportional



Equal



Constant

Explanation

$$V \propto \frac{1}{P}$$

$$\text{if } \frac{1}{P} = x \Rightarrow V \propto x$$

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Correct



Unattempted



Incorrect



3/10

Q : Volume of gas at 0°C and 1 atm pressure is 10dm<sup>3</sup>,  
volume of gas at 0.8atm will be



10dm<sup>3</sup>



12.5dm<sup>3</sup>



8dm<sup>3</sup>



5dm<sup>3</sup>

Explanation

$$P_1V_1 = P_2V_2$$
$$V_2 = \frac{P_1V_1}{P_2} = \frac{1 \times 10}{0.8} = 12.5$$

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Correct



Unattempted



Incorrect



4/10

Q : Which is not equal to 1 atm



1.013 25 Bar



14.7 psi



1.01325 KPa



101325 Pa

Explanation

1 atm 1.013 25 Bar = 14.7 psi = 101325 Pa = 760mmHg = 101.325Kpa

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Unattempted



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5/10

Q : Gases are soluble in water at



Low temperature and high pressure



High temperature and high pressure



Low temperature and low pressure



High temperature and low pressure

Explanation

gases are soluble in water at high temperature which increase the forces of attraction in gases so solubility increases.

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6/10

Q : The molar volume of  $\text{CO}_2$  gas is maximum at



273 k and 1 atm



127°C and 1 atm



0°C and 2 atm



273°C and 2 atm

Explanation

Volume of gas is directly proportional to temperature,

127°C = 400K which is highest with lowest pressure

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7/10

Q : If volume of  $O_2$  is  $11.2dm^3$  at STP, then the number of moles would be



2.0 moles



0.5 moles



1.0 moles



0.25 moles

Explanation

$$11.2dm^3 = 0.5mole$$

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Correct



Unattempted



Incorrect



8/10

Q : For a given mass with initial volume 'V', if pressure is reduced to one half and absolute temperature is increased two times. The volume will become



2V<sup>2</sup>



2V



4V



6V

Explanation

$$V \propto \frac{1}{P}, V \propto T, \frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

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← Practice Test-1(Gases)



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Incorrect



9/10

Q : Pressure remaining constant at which temperature the volume of gas will become twice of what it is at  $0^{\circ}\text{C}$



546  $^{\circ}\text{C}$



200  $^{\circ}\text{C}$



546 K



273 K

Explanation

$0^{\circ}\text{C} = 273\text{K}$ , by doubling the temperature, volume of gas became double,

$273\text{K} \rightarrow V,$

$546\text{K} \rightarrow 2V,$



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10/10

Q : The equation  $V_t = V_o \left(1 + \frac{t}{273}\right)$  is based on



Celsius scale



Fahrenheit scale



Kelvin scale



Absolute scale

Explanation

If temperature is taken in Celsius scale we can use this equation.

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## QUIZZES

Practice Test-2(Gases)



10 Questions



7 min

Topics

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06 : 58



1/10



7 min



Hint

Q : The units of 'R' depends upon



Pressure



Temperature



Volume



Both A and C

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06 : 56



2/10



7 min



Hint

Q : A container contains 0.2 moles of  $H_2$ , 0.3 moles of  $O_2$  and 0.5 moles of  $N_2$ . What is the total pressure exerted by mixture of gases if volume of container is  $20 \text{ dm}^3$ , temperature is  $25^\circ\text{C}$  and  $R = 0.0821 \text{ atm dm}^3 \text{ mol}^{-1} \text{ K}^{-1}$



22.4 atm



1.12 atm



11.2 atm



2.24 atm

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06 : 54



3/10



7 min



Hint

Q : If temperature of 1 mole of gas is raised by 1K, then it would absorb \_\_\_\_\_ amount of energy



1.98J



0.0821 J



0.0821 dm<sup>3</sup> atm



8.314 cal

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06 : 52



4/10



7 min



Hint

Q : When the value of general gas constant 'R' is given as 8.314, the relevant units will be



Cal , mol<sup>-1</sup> degree<sup>-1</sup>



dm<sup>3</sup> . atm mol<sup>-1</sup> . k<sup>-1</sup>



J. mol<sup>-1</sup> . K<sup>-1</sup>



Ergs.mol<sup>-1</sup>.degree<sup>-1</sup>

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06 : 50



5/10



7 min



Hint

Q : The root mean square velocity at STP for the gases  $H_2$ ,  $N_2$ ,  $O_2$  and  $HBr$  are in the order



$H_2 < N_2 < O_2 < HBr$



$HBr < O_2 < N_2 < H_2$



$H_2 < N_2 < HBr < O_2$



$HBr < O_2 < H_2 < N_2$

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06 : 48



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7 min



Hint

Q : The molecules of which gas has highest average kinetic energy at  $25^{\circ}\text{C}$



$\text{CO}_2$



$\text{O}_2$



$\text{CH}_4$



All have same

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06 : 47



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7 min



Hint

Q : A gas with lowest root mean square velocity at 300K. is



SO<sub>2</sub>



SO<sub>3</sub>



Cl<sub>2</sub>



H<sub>2</sub>

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7 min



Hint

Q : All of the following are conclusions of the kinetic theory of gases except



Derivation of the Van der waal's equation



Derivation of Boyle's and Charle's law



Relation of average kinetic energy of gases to temperature



Graham`s law of diffusion

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06 : 42



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7 min



Hint

Q : 16g of each of  $\text{CH}_4$  and He are in a container at  $50^\circ\text{C}$ .  
The ratio of kinetic energy is



1:16



16:1



1:4



4:1

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06 : 40



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7 min



Hint

Q : In a closed vessel of  $1000 \text{ cm}^3$ ,  $\text{H}_2$  gas is heated from  $27^\circ\text{C}$  to  $127^\circ\text{C}$ . Which statement is not correct



The rate of collision increases



The energy of gas molecules increases



Pressure of gas increases



The number of moles of gas increase

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## QUIZ RESULT

Practice Test-2(Gases)



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7 min



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Result Detail

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← Practice Test-2(Gases)



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1/10

Q : The units of 'R' depends upon



Pressure



Temperature



Volume



Both A and C

Explanation

The units of 'R' depends upon units of pressure and volume. By changing unit of P, V unit of R is changed.

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← Practice Test-2(Gases)



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Q : A container contains 0.2 moles of  $H_2$ , 0.3 moles of  $O_2$  and 0.5 moles of  $N_2$ . What is the total pressure exerted by mixture of gases if volume of container is  $20\text{ dm}^3$ , temperature is  $25^\circ\text{C}$  and  $R = 0.0821\text{ atm dm}^3\text{ mol}^{-1}\text{ K}^{-1}$



22.4 atm



1.12 atm



11.2 atm



2.24 atm

Explanation

$$n = 0.2 + 0.3 + 0.5 = 1$$

$$P = 298\text{K} \approx 300$$

$$PV = nRT$$

$$P = \frac{nRT}{V} = \frac{1 \times 0.0821 \times 300}{20} = 1.12\text{ atm}$$



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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



3/10

Q : If temperature of 1 mole of gas is raised by 1K, then it would absorb \_\_\_\_\_ amount of energy



1.98J



0.0821 J



0.0821 dm<sup>3</sup> atm



8.314 cal

Explanation

If temperature of 1 mole of gas is raised by 1K, then it would absorb 0.0821dm<sup>3</sup> atm amount of energy

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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



4/10

Q : When the value of general gas constant 'R' is given as 8.314, the relevant units will be



Cal , mol<sup>-1</sup> degree<sup>-1</sup>



dm<sup>3</sup> . atm mol<sup>-1</sup> . k<sup>-1</sup>



J. mol<sup>-1</sup> . K<sup>-1</sup>



Ergs.mol<sup>-1</sup>.degree<sup>-1</sup>

Explanation

$R=8.314\text{Jk}^{-1}\text{mol}^{-1}$  is the S.I units of "R"

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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



5/10

Q : The root mean square velocity at STP for the gases  $H_2$ ,  $N_2$ ,  $O_2$  and  $HBr$  are in the order



$H_2 < N_2 < O_2 < HBr$



$HBr < O_2 < N_2 < H_2$



$H_2 < N_2 < HBr < O_2$



$HBr < O_2 < H_2 < N_2$

Explanation

$HBr < O_2 < N_2 < H_2$

$$C_{rms} = \sqrt{\frac{3RT}{M}} \rightarrow C_{rms} \propto \frac{1}{\sqrt{M}}$$

$HBr$  = Polar

$O_2$  = 32g/mol

$N_2$  = 28g/mol

$H_2$  = 2.016g/mol

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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



6/10

Q : The molecules of which gas has highest average kinetic energy at 25<sup>0</sup>C



CO<sub>2</sub>



O<sub>2</sub>



CH<sub>4</sub>



All have same

Explanation

Average kinetic energy  $\propto$  Temperature

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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



7/10

Q : A gas with lowest root mean square velocity at 300K. is



SO<sub>2</sub>



SO<sub>3</sub>



Cl<sub>2</sub>



H<sub>2</sub>

Explanation

$$C_{rms} \propto \frac{1}{\sqrt{M}}$$

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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



8/10

Q : All of the following are conclusions of the kinetic theory of gases except



Derivation of the Van der waal's equation



Derivation of Boyle's and Charle's law



Relation of average kinetic energy of gases to temperature



Graham`s law of diffusion

Explanation

Derivation of the Van der waal's equation is not conclusion of the kinetic theory of gases.

Van der Waal's equation for non-ideal gases cannot be derived from kinetic molecular theory but gas laws and temperature interpretation can be derived from KMT.

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Correct



Unattempted



Incorrect



9/10

Q : 16g of each of  $\text{CH}_4$  and He are in a container at  $50^\circ\text{C}$ .  
The ratio of kinetic energy is



1:16



16:1



1:4



4:1

Explanation

$$\frac{(K.E)_1}{(K.E)_2} = \frac{M_{\text{He}}}{M_{\text{CH}_4}} = \frac{4}{16} = \frac{1}{4}$$

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← Practice Test-2(Gases)



Correct



Unattempted



Incorrect



10/10

Q : In a closed vessel of  $1000 \text{ cm}^3$ ,  $\text{H}_2$  gas is heated from  $27^\circ\text{C}$  to  $127^\circ\text{C}$ . Which statement is not correct



The rate of collision increases



The energy of gas molecules increases



Pressure of gas increases



The number of moles of gas increase

Explanation

Number of moles are independent of temperature

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## QUIZZES

Practice Test-3 (Gases)



10 Questions



7 min

Topics

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06 : 58



1/10



7 min



Hint

Q : Van der Waal's equation is reduced to general gas equation at



High temperature and low pressure



Low temperature and high pressure



High temperature and high pressure



Low temperature and low pressure

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06 : 57



2/10



7 min



Hint

Q : Which of the following statement is correct according to the Vander Waal's equation



'a' and 'b' constant of both  $\text{NH}_3$  and  $\text{N}_2$  have greater value



'a' and 'b' constant of both  $\text{NH}_3$  and  $\text{N}_2$  have smaller value



'a' constant of  $\text{NH}_3$  is greater than that of  $\text{N}_2$  and b constant of  $\text{NH}_3$  is less than that of  $\text{N}_2$



'a' constant of  $\text{NH}_3$  is smaller than that of  $\text{N}_2$  and 'b' constant of  $\text{NH}_3$  is more than that of  $\text{N}_2$

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06 : 52



3/10



7 min



Hint

Q : All of the following equations are expressions for the ideal gas law except



$$PV = nRT$$



$$PV/T = \text{constant}$$



$$P_1V_1/T_1 = P_2V_2/T_2$$



$$(P + n^2a/V^2)(V-nb) = nRT$$

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06 : 50



4/10



7 min



Hint

Q : Real gases show more deviation from ideal behaviour under which of the following conditions



At high temperature and low pressure



at low temperature and low pressure



at low temperature and high pressure



at high temperature and high pressure

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06 : 49



5/10



7 min



Hint

Q : A gas that has highest value for vander waals coefficient of attraction



NH<sub>3</sub>



CO<sub>2</sub>



H<sub>2</sub>



O<sub>2</sub>

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06 : 47



6/10



7 min



Hint

Q : In Vander Waal's equation, if the value of 'a' and 'b' are zero for a certain gas, then the gas is



Non ideal



Real



Ideal



Noble gas

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06 : 45



7/10



7 min



Hint

Q : Neon gas has low critical temperature and pressure as compared to other noble gases except helium. The most probable reason is that



Its octet is complete



It has very low polarizability



It is mono atomic gas



It has no forces of attraction

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06 : 43



8/10



7 min



Hint

Q : Effective volume of molecules per mole of a gas is\_\_\_\_  
times greater than actual volume of 1 mole of gas molecules.



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06 : 42



9/10



7 min



Hint

Q : Which of the following shows strange behavior when subjected to gradual increase in pressure at  $0^{\circ}\text{C}$



$\text{H}_2$



He



$\text{CO}_2$



all show same behavior

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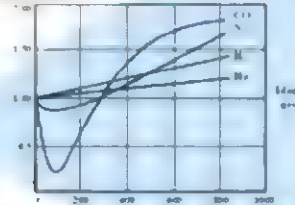


7 min



Hint

In the following graph



Q : Which quantities are represented by X-axis and Y-axis.

**X-axis**

Temperature

**Y-axis**

PV

**X-axis**

Pressure

**Y-axis** $PV/nRT$ **X-axis**

Volume

**Y-axis** $PV/nRT$ **X-axis**

Number of moles

**Y-axis** $PV/nRT$ 

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## QUIZ RESULT

Practice Test-3(Gases)



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7 min



05-Apr-2021



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Result Detail

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Correct

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← Practice Test-3(Gases)



Correct



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1/10

Q : Van der Waal's equation is reduced to general gas equation at



High temperature and low pressure



Low temperature and high pressure



High temperature and high pressure



Low temperature and low pressure

Explanation

At high temperature and low pressure forces in real gases become insignificant

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← Practice Test-3(Gases)



Correct



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2/10

Q : Which of the following statement is correct according to the Vander Waal's equation



'a' and 'b' constant of both  $\text{NH}_3$  and  $\text{N}_2$  have greater value



'a' and 'b' constant of both  $\text{NH}_3$  and  $\text{N}_2$  have smaller value



'a' constant of  $\text{NH}_3$  is greater than that of  $\text{N}_2$  and b constant of  $\text{NH}_3$  is less than that of  $\text{N}_2$



'a' constant of  $\text{NH}_3$  is smaller than that of  $\text{N}_2$  and 'b' constant of  $\text{NH}_3$  is more than that of  $\text{N}_2$

Explanation

'a' constant of  $\text{NH}_3$  is greater than that of  $\text{N}_2$  because  $\text{NH}_3$  is polar while  $\text{N}_2$  is non-polar and 'b' constant of  $\text{NH}_3$  is less than that of  $\text{N}_2$  because  $\text{N}_2$  molecule is larger in size as compared to  $\text{NH}_3$  is correct according to the Van der Waal's equation.

'a' = attractive forces constant

'b' = effective volume constant

$\text{NH}_3$  has greater intermolecular forces than  $\text{N}_2$  and  $\text{N}_2$  has little greater volume at closest approach in the gaseous state.

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← Practice Test-3(Gases)



Correct



Unattempted



Incorrect



3/10

Q : All of the following equations are expressions for the ideal gas law except



$PV = nRT$



$PV/T = \text{constant}$



$P_1V_1/T_1 = P_2V_2/T_2$



$(P + n^2a/V^2)(V-nb) = nRT$

Explanation

$(P + n^2a/V^2)(V-nb) = nRT$  are not expressions for the ideal gas law. It's Van der Waal's equation for non-ideal gas  
 $(P+n^2a/V^2)(V - nb) = nRT$ .  
Ideal or general gas equation

$PV = nRT$ ,  $\frac{PV}{T} = \text{constant}$  and  $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$  are different forms of ideal or general gas equation.

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← Practice Test-3(Gases)



Correct



Unattempted



Incorrect



4/10

Q : Real gases show more deviation from ideal behaviour under which of the following conditions



At high temperature and low pressure



at low temperature and low pressure



at low temperature and high pressure



at high temperature and high pressure

Explanation

Real gases deviate from ideal behavior at low temperature and high pressure.

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← Practice Test-3(Gases)



Correct



Unattempted



Incorrect



5/10

Q : A gas that has highest value for vander waals coefficient of attraction



NH<sub>3</sub>



CO<sub>2</sub>



H<sub>2</sub>



O<sub>2</sub>

Explanation

NH<sub>3</sub> being polar molecule it had highest coefficient of attraction

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← Practice Test-3(Gases)



Correct



Unattempted



Incorrect



6/10

Q : In Vander Waal's equation, if the value of 'a' and 'b' are zero for a certain gas, then the gas is



Non ideal



Real



Ideal



Noble gas

Explanation

$$\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$$

$$a \approx 0 \quad b \approx 0$$
$$PV = nRT$$

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## Practice Test-3(Gases)



Correct



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Incorrect



7/10

Q : Neon gas has low critical temperature and pressure as compared to other noble gases except helium. The most probable reason is that



Its octet is complete



It has very low polarizability



It is mono atomic gas



It has no forces of attraction

Explanation

Weak London dispersion forces are due to low polarizability.

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## Practice Test-3(Gases)



Correct



Unattempted



Incorrect



8/10

Q : Effective volume of molecules per mole of a gas is\_\_\_\_ times greater than actual volume of 1 mole of gas molecules.

A

2

B

3

C

4

D

5

Explanation

$$b = 4V_m$$

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## Practice Test-3(Gases)



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9/10

Q : Which of the following shows strange behavior when subjected to gradual increase in pressure at  $0^{\circ}\text{C}$



$\text{H}_2$



He



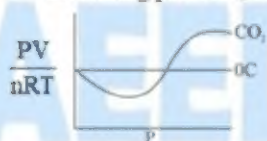
$\text{CO}_2$



all show same behavior

Explanation

On increasing pressure, compressibility factor decreases then it keeps increasing



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Practice Test-3(Gases)

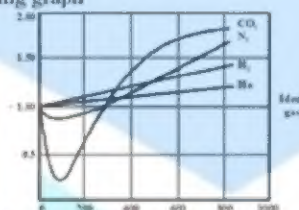
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In the following graph



Q : Which quantities are represented by X-axis and Y-axis

A

X-axis  
Temperature

Y-axis  
PV

B

X-axis  
Pressure

Y-axis  
 $PV/nRT$

C

X-axis  
Volume

Y-axis  
 $PV/nRT$

D

X-axis  
Number of moles

Y-axis  
 $PV/nRT$

Explanation

Pressure taken on X-axis and  $Z = PV / nRT$  at Y-axis

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